

Cost escalation factors (2020-21 to 2024-25)

Prepared for Gladstone Area Water Board

15 August 2019

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By email: AMoody@gawb.qld.gov.au

Dear Angela

Cost escalation factors

Thank you for asking Deloitte Access Economics to complete this engagement for the Gladstone Area Water Board (GAWB).

This report accompanies the cost escalation factors provided to you in Microsoft Excel format. This report details the methodology utilised to create nominal and real cost escalation factors for the period 2020-21 to 2024-25. The methodology builds on our existing macroeconomic forecasts for the Queensland economy, in particular the forecasts for the Consumer Price Index (CPI) and Wage Price Index (WPI).

The cost escalation factors were finalised in July 2019 and draw on macroeconomic forecasts that underpin the March 2019 *Business Outlook* publication.

Yours sincerely,



David Rumbens
Partner
Deloitte Access Economics Pty Ltd

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1 Background

1.1 Deloitte Access Economics' macroeconomic model

The cost escalation factors presented in this report draw on Deloitte Access Economics' macroeconomic forecasts for the Queensland economy, in particular the forecasts for the Consumer Price Index (CPI) and Wage Price Index (WPI).

The Deloitte Access Economics Macroeconomic model (DAEM) is a dynamic model of the whole Australian economy. It has a theoretically consistent long-term open-economy growth path, together with short-term dynamics derived from Australia's economic experience over the past 30 years. The model provides internally consistent forecasts for key economic variables – including Gross Domestic Product (GDP) and its components (at the national and state levels), employment, exchange rates, price inflation, wages and interest rates.

Economic forecasts take into account the likely investment outlook going forward as informed by Deloitte Access Economics' *Investment Monitor* publication. As a result, key projects in the Queensland and broader Australian economies have been taken into account when preparing baseline forecasts. If the investment outlook is stronger than forecast, it is likely that macroeconomic forecasts will be stronger as well, extending to relevant variables such as wage growth. The alternative is also true if the investment outlook is weaker than forecast.

The model also includes a number of measures of wages. The central measure is average quarterly earnings estimated from the national accounts. Other measures include average weekly ordinary time earnings, average weekly earnings and the WPI.

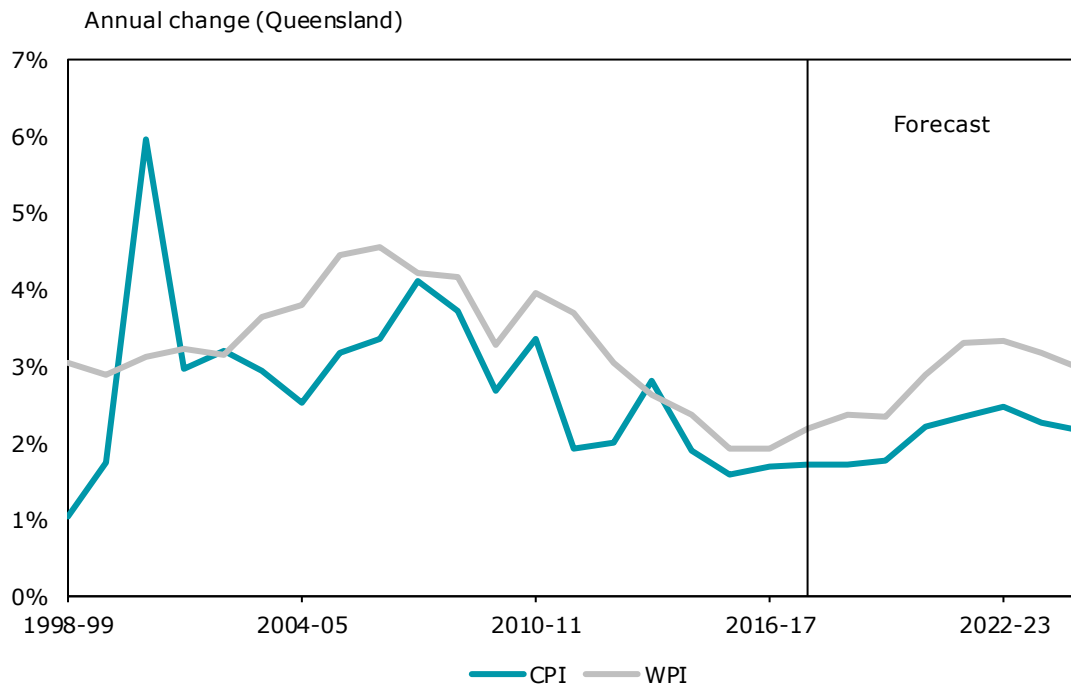
Deloitte Access Economics' macroeconomic modelling infrastructure therefore provides rigorous forecasts of relevant variables underpinning certain cost categories, such as the CPI and the WPI. Price and wage inflation in the DAEM are governed by the behavioural equations of the:

- Business sector output gap
- Real exchange rate
- Import prices (including oil prices)
- Monetary policy reaction function
- Average quarterly wages
- Underlying consumer price index.

Over many years, the WPI forecasts produced by the DAEM have been used to inform the Australian Energy Regulator's preparation of revenue determinations for electricity and gas providers. In 2014 and 2017, Deloitte Access Economics was named the recipient of the Consensus Economics Forecast Accuracy Award for Australia.

Chart 1.1 shows Deloitte Access Economics' forecasts for CPI and WPI for Queensland. There has been a significant fall in inflationary pressure since the 2008 Financial Crisis. The Queensland economy also faced significant challenges from the winding down of mining investment and the fall in commodity prices in 2014-15. However, prospects for the Queensland economy have since improved amid healthier commodity prices as well as Queensland's service offerings in tourism and international education. Combined with this, Queensland's more affordable housing market has incentivised increased net interstate migration and as a result, population and employment growth have increased and the unemployment rate has fallen. With this healthier outlook, Deloitte Access Economics forecasts that both CPI and WPI growth will start to consolidate, with a move higher in 2020-21.

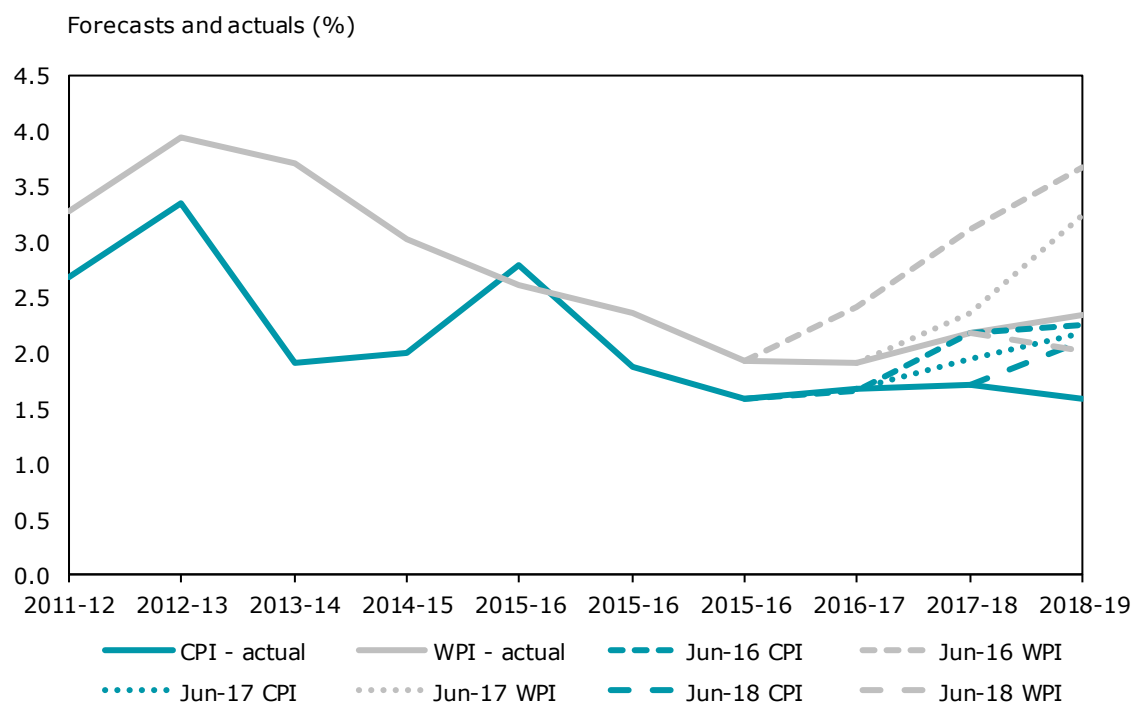
Chart 1.1: Brisbane CPI and Queensland WPI growth



Source: Deloitte Access Economics, ABS

Chart 1.2 shows how actual Queensland WPI and CPI growth has compared to Deloitte Access Economics’ forecasts for those variables in the June-2016, June-2017 and June-2018 *Business Outlook* forecasts. Like official government forecasts, and predictions from other forecasters, the persistence of weak wage and inflationary pressures has been unexpected. That said, there are tentative signs of firming wage growth and the 2018-19 wage growth is set to be marginally higher (pending the June quarter release) than Deloitte Access Economics had forecast in the June-2018 *Business Outlook*.

Chart 1.2: Forecast and actuals: Queensland CPI and WPI



Source: Deloitte Access Economics, ABS

Note: 2018-19 values for WPI and CPI growth are Deloitte Access Economics' most recent estimates based on the first three quarters of released data.

Table 1.1 shows how Deloitte Access Economics' recent forecasts have differed from actual CPI and WPI growth in Queensland. Differences have been presented as forecasts less actuals, and so a positive number indicates Deloitte Access Economics' forecast was higher than the actual outcome in that year. For example, in the June 2016 edition of forecasts, Deloitte Access Economics forecast 1.65% CPI growth in the year ahead in Queensland, compared to an actual 1.68% increase (-0.03% difference).

Table 1.1: Forecasts, % deviation from actual outcome (forecast less actual)

	2016-17	2017-18	2018-19
Jun-16 CPI	-0.03	0.45	0.67
Jun-16 WPI	0.51	0.94	1.33
Jun-17 CPI	-	0.22	0.59
Jun-17 WPI	-	0.18	0.89
Jun-18 CPI	-	-	0.52
Jun-18 WPI	-	-	-0.33

Source: Deloitte Access Economics

Note: 2018-19 values for WPI and CPI growth are Deloitte Access Economics' most recent estimates based on the first three quarters of released data.

2 Cost escalation factors

2.1 Cost escalation factors summary

Deloitte Access Economics has been engaged to provide nominal and real cost escalation factors over the period 2020-21 to 2024-25 for the following cost categories:

- CPI
- Employee costs
- Contract labour costs
- Contractors (service delivery costs)
- Electricity
- Chemicals
- Other materials and services
- Professional services (engineering)
- Capital expenditure (capex)
- Rates (Gladstone Regional Council)
- Insurance.

Table 2.1 provides a summary of nominal cost escalation factors for the different cost categories using Compound Annual Growth Rates (CAGRs).

Table 2.1: Nominal cost escalation factors

Cost category	CAGR (2020-21 to 2024-25)
CPI	2.30%
Employee costs	3.22%
Contract labour costs	3.04%
Contractors (service delivery)	3.04%
Electricity	2.06%
Chemicals	3.03%
Other materials and services	2.85%
Professional services (engineering)	3.04%
Capex	2.82%
Rates (Gladstone Regional Council)	2.82%
Insurance	5.70%

Source: Deloitte Access Economics

Table 2.2 provides a high-level summary of the basis for the forecasts. The methodologies used to calculate cost escalation factors for these different cost categories are discussed in more detail below.

Table 2.2: Nominal cost escalation factors: methodology

Cost category	Methodology
CPI	DAEM forecast*
Employee costs	QLD WPI & premium
Contract labour costs	QLD WPI
Contractors (service delivery)	QLD WPI
Electricity	Component forecast (CPI based)
Chemicals	DAEM Crude oil price (lagged)
Other materials and services	75% QLD WPI, 25% Brisbane CPI
Professional services (engineering)	QLD WPI
Capex	70% QLD WPI, 30% Brisbane CPI
Rates (Gladstone Regional Council)	Component forecast
Insurance	Brisbane CPI + observed historical premium

Source: Deloitte Access Economics

*: Deloitte Access Economics Macroeconomic Model

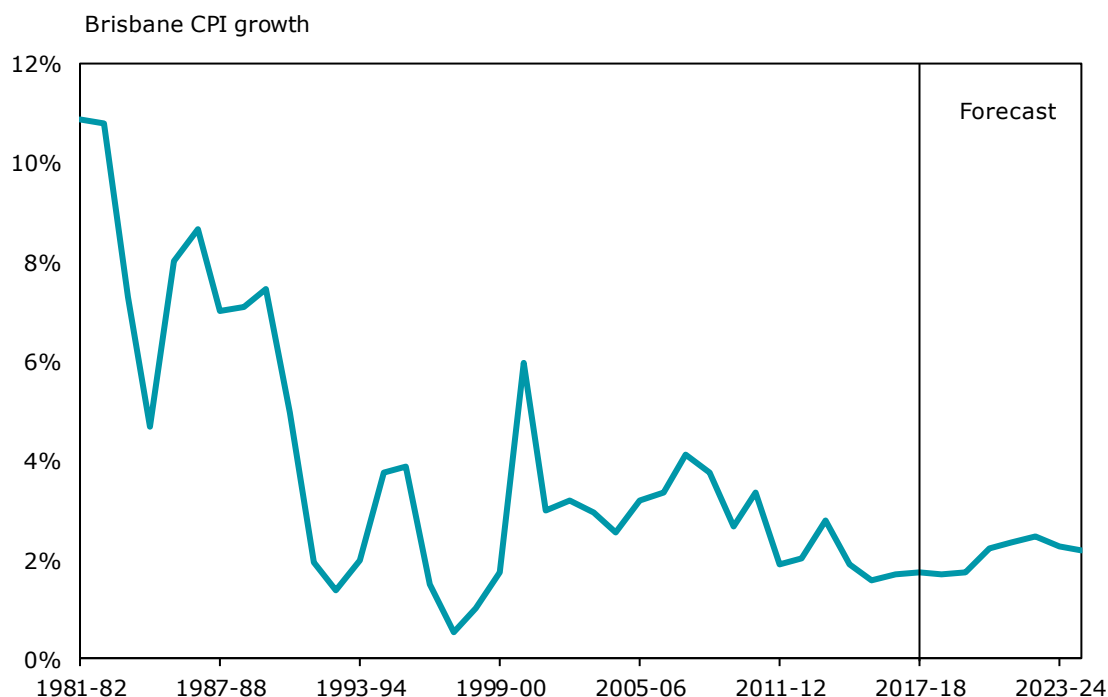
2.2 CPI

Brisbane all groups CPI is regularly forecast as a part of Deloitte Access Economics' quarterly macroeconomic modelling processes.

Inflation growth in Brisbane has been contained in recent years, with annual inflation slightly below 2% since 2014-15. That reflected global disinflationary pressures and the drag associated with the recent downturn in mining investment activity in Queensland, which was exacerbated by a sharp correction in commodity prices in 2014-15 and into 2015-16. Since then, commodity prices have recovered, as have prospects for the Queensland economy more broadly. Combined with recent renewed stimulus by the Reserve Bank of Australia (RBA), Deloitte Access Economics forecasts that Brisbane CPI growth will increase to be over 2% by 2020-21.

Chart 2.1 shows Deloitte Access Economics' forecast for Brisbane CPI growth in the period to 2024-25.

Chart 2.1: Brisbane CPI growth



Source: Deloitte Access Economics, ABS

2.3 Employee costs

In forecasting cost escalation factors for employee costs, Deloitte Access Economics considered relevant benchmarks such as the WPI in Queensland (for public, private and total employment) and the WPI in the Queensland utilities sector.

Deloitte Access Economics considered using Queensland WPI for the electricity, gas, water and waste services (utilities) sector as a potential forecast driver. However, Queensland WPI (specifically, public sector WPI) was found to be a more suitable driver.

Chart 2.2 shows how Queensland wage growth has differed between the public and private sectors over the past two decades. Since 2014-15, private sector wage growth has been historically weak compared to public sector wage growth. The Queensland economy has faced challenges arising from the winding down in mining investment activity in the state over this period. In this case, it is not surprising that public sector wage growth has been more resilient.

Chart 2.2: Queensland wage growth (public and private sector)



Source: Deloitte Access Economics, ABS

Deloitte Access Economics develops WPI forecasts on a quarterly basis as part of a broader set of macroeconomic forecasts. In forecasting cost escalation factors for GAWB employee costs, Deloitte Access Economics has utilised forecasts for Queensland WPI as well as a forecast premium for GAWB employees (as public sector employees) on top of WPI growth.

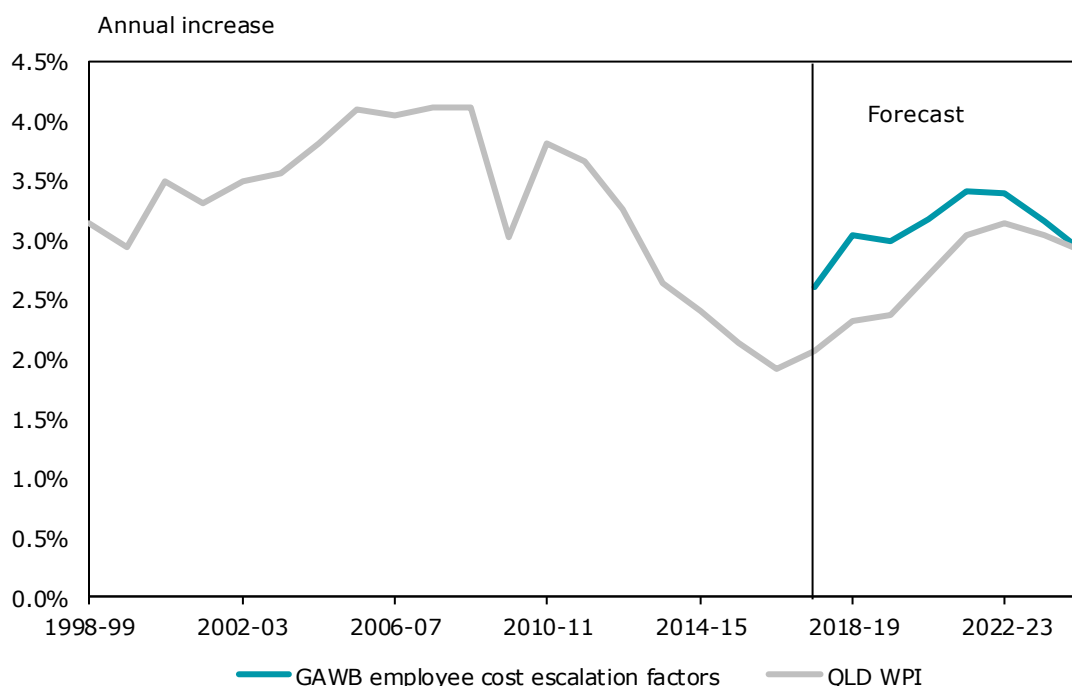
Looking forward, as wage growth is forecast to gradually pick-up in the Queensland economy, Deloitte Access Economics expects that the recent outperformance in public sector wage growth will start to recede.

Deloitte Access Economics notes that GAWB is a regional business and the profile of its employees does not necessarily reflect a typical employee sample. Despite this, Deloitte Access Economics' view is that in the long run, wage increases will nonetheless track those seen in the broader Queensland economy. Over time, persistent significant divergences in wage growth would lead to imbalances in wages relative to other occupations or regions. In those cases, competitive pressures, namely flexibility in the supply of labour, would be expected to counteract those imbalances.

Queensland WPI growth and cost escalation factors for GAWB employees are subsequently forecast to converge by 2024-25. By 2024-25, WPI growth in Queensland is forecast to have returned to a healthier rate of close to 3%.

Chart 2.3 shows the resulting cost escalation factor forecast for employee costs as well as the comparison to Queensland WPI growth.

Chart 2.3: GAWB wage increase comparison to Queensland WPI



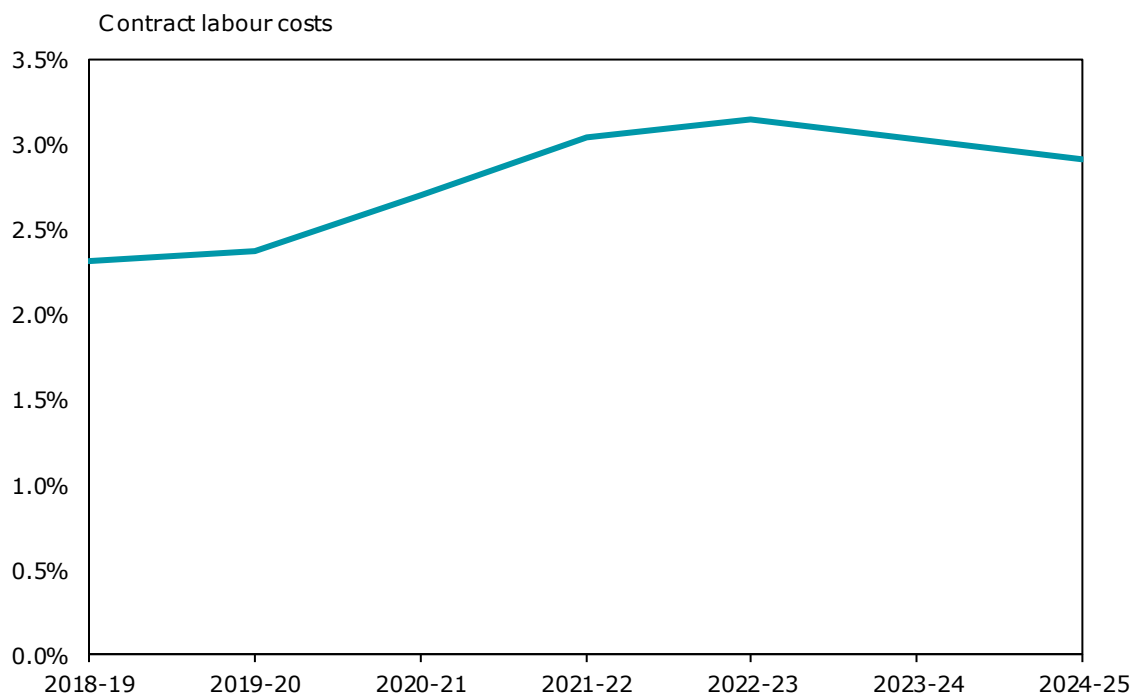
Source: Deloitte Access Economics, ABS, GAWB

2.4 Contract labour costs

Based on correspondence with GAWB, Deloitte Access Economics understands contract labour has been utilised to complete office specific roles, including parental leave relief within the business, utilising large external agencies. Given a scarcity of data, it is difficult to obtain a historical time series of contract labour costs on a per unit basis as it relates to GAWB’s operations. This reflects the range of different roles, often short duration, as well as the fact it may be difficult to identify what wages contracted labour workers are being paid; for instance when the cost of contract labour also includes payment to a labour hire agency.

In Deloitte Access Economics’ view, Queensland WPI growth represents a strong basis for forecasting cost escalation factors for contract labour costs. From a macroeconomic perspective, increases in contract labour are likely to closely track increases in wage gains more broadly. If growth in the two series were to be consistently different, contract labour and employee costs would consistently diverge over time, which is unlikely to occur. Chart 2.4 shows the resulting cost escalation forecast for contract labour costs, mirroring the forecast profile for Queensland WPI growth.

Chart 2.4: Contract labour costs

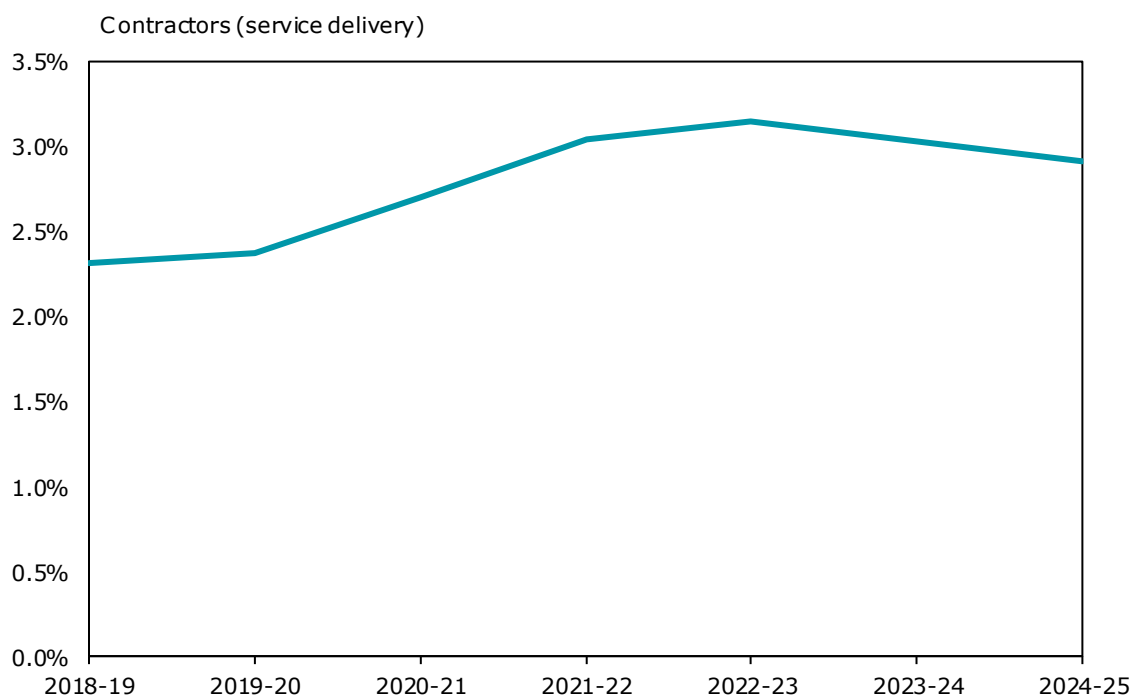


Source: Deloitte Access Economics

2.5 Contractors (service delivery costs)

Based on correspondence with GAWB, Deloitte Access Economics understands service contractors have been engaged to perform maintenance work under GAWB’s Life Cycle Management Plan (LCMP) system. Service contractors typically quote a fixed price for the work in question, with job rates included within the scope of work with descriptions such as: ‘checking’, ‘labour’ and ‘repair’. It is therefore difficult to gauge changes in labour rates at the company supplying the services to GAWB. As in the case of contract labour, Deloitte Access Economics considers it reasonable to expect that cost escalation factors for contractors will evolve in line with Queensland WPI growth. The resulting forecast for cost escalation factors for contractors (service delivery costs) is shown in Chart 2.5.

Chart 2.5: Cost escalation factors: contractors (service delivery)



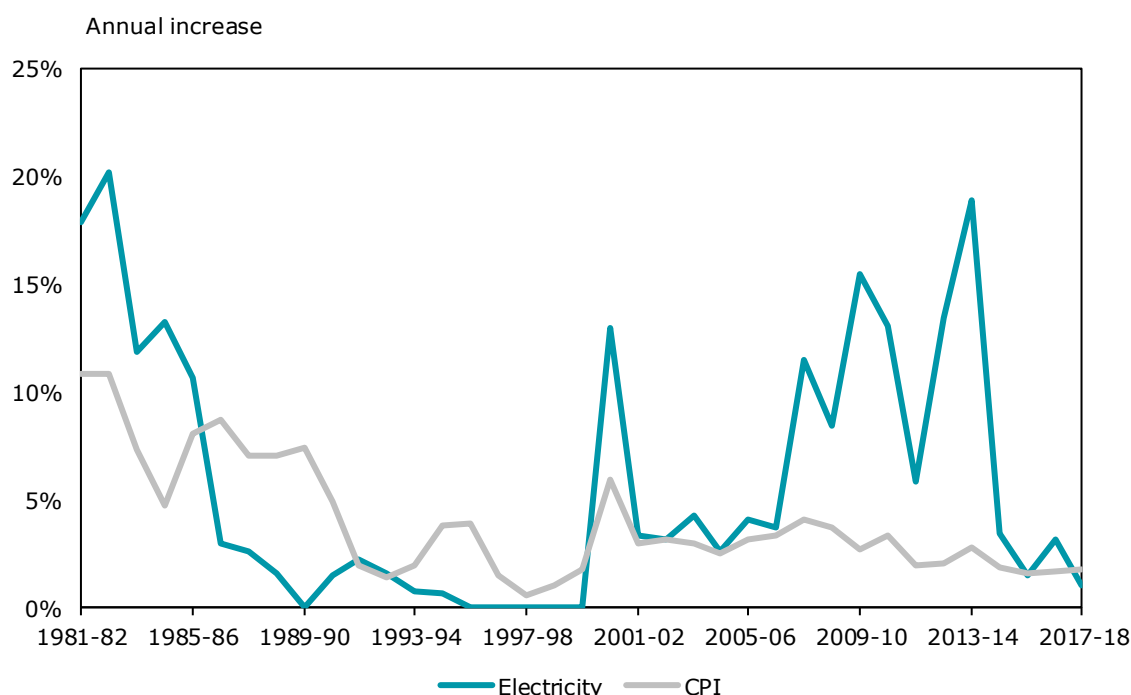
Source: Deloitte Access Economics

2.6 Electricity

Electricity prices have increased significantly in recent years in both Queensland and Australia more broadly. Chart 2.6 shows historical growth in the CPI index for Electricity in Brisbane, which has significantly exceeded broader CPI growth in the last decade. From 2007-08 to 2017-18, electricity prices increased by a CAGR of 8.2%, compared to broader inflation growth of 2.3% over the same period. Energy policy uncertainty at the Federal level, and the transition to higher use of renewable energy sources has contributed to this substantial increase in electricity prices. The substantial historical divergence compared to broader inflation presents a challenge for forecasting cost escalation factors going forward.

Yet, the substantial recent increase in electricity prices has also led to increased policy focus on helping to lower prices. As a result, investment into electricity generation, particularly from renewable sources, has increased significantly in recent years. This has helped to ease the upward pressure on electricity prices. Pending the June quarter of inflation data, it looks as if electricity prices in Brisbane will ease in 2018-19 compared to the prior year.

Chart 2.6: Annual increase in electricity prices and CPI (Brisbane)



Source: Deloitte Access Economics, ABS

Forecasting trends in electricity prices is difficult. Prices will be influenced by national energy policy, changes in regulatory arrangements both at a national and state level, conditions in energy markets, state government policies including subsidisation of regional electricity price, the details of renewable energy policies and targets, and the specific tariff structures and charges applied by GAWB’s retailer, Ergon Energy. The approach to defining a cost escalation path for GAWB’s electricity costs below reflects broader trends in the energy market, combined with short term outcomes where known.

GAWB’s current electricity network provider is Ergon Energy, which merged with Energex in 2016 to become part of Energy Queensland. In forecasting cost escalation factors, Deloitte Access Economics has adopted an approach of forecasting the different components of electricity costs.

It is understood that some of GAWB’s meters are subject to notified tariffs set by the Queensland Competition Authority (QCA). The QCA’s May 2019 final determination¹ provides for notified tariffs in 2019-20 which are:

- An estimated 5.8% lower than in 2018-19 for small businesses on a flat rate tariff, and 3.8% lower for small businesses on a time of use tariff
- Between 7.0% and 9.1% lower for large businesses.

Broadly speaking, electricity costs comprise:

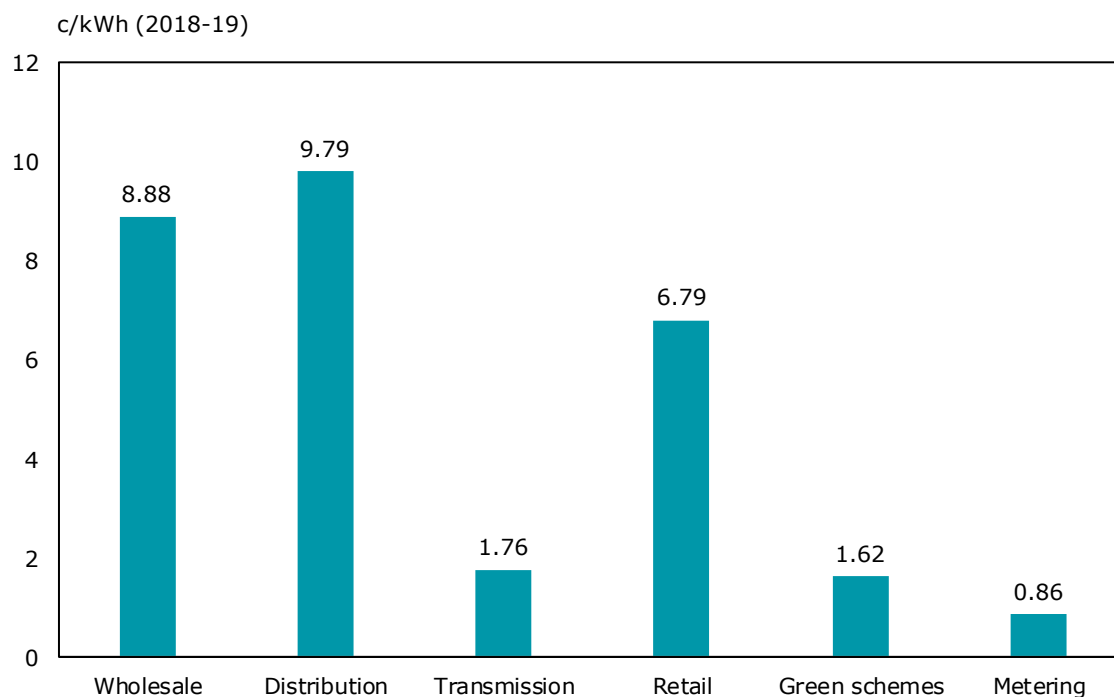
1. Wholesale (generation) costs
2. (a) Network transmission and (b) Network distribution costs
3. Retail costs
4. Green schemes
5. Metering costs.

The percentage of costs in each of these categories depends on the geography/prices/customer. Deloitte Access Economics has taken the percentages provided by Australian Energy Market

¹ Queensland Competition Authority, *Final Determination Regulated retail electricity prices for 2019-20*, p. 83

Commission (AEMC) for the South-East Queensland region in its 2018 Residential Electricity Price Trends Report as indicative shares for GAWB.² In 2018-19, wholesale costs comprised 30% of costs, network costs 39%, retail 23%, green schemes 5% and metering 3%. It is worth noting that larger electricity users such as GAWB may have a larger share of costs in the wholesale component of electricity costs. Chart 2.7 shows the split of costs for the median market retail offer in South-East Queensland 2018-19 according to AEMC (excluding GST).

Chart 2.7: Components of retail electricity costs in South-East Queensland 2018-19



Source: Deloitte Access Economics, AEMC

In forecasting these components of electricity costs, Deloitte Access Economics has utilised the short-term forecasts prepared for AEMC for the South-East Queensland region as well as the regulatory determinations pertaining to Ergon Energy and Powerlink in considering changes in distribution and transmission costs respectively. The five components of electricity costs are discussed in more detail below.

The AEMC report has been used as the basis for the wholesale price forecasts rather than the QCA report as the AEMC report provides detail to 2020-21 while the QCA does not. In doing, it is noted that:

- the two are largely consistent in respect of changes in tariffs in 2019-20 – our ‘ground-up’ forecast using the AEMC data provides for an estimated 8.8% reduction in energy prices in 2019-20, which is consistent (although at the upper end) of the notified tariff reductions in the QCA report
- the AEMC report provides for very limited change in wholesale prices between 2019-20 and 2020-21 (the first year of our forecast period).

Wholesale costs

In the wholesale market costs modelling undertaken by EY for the AEMC, it was forecast that Queensland would experience falling wholesale spot market prices from 2017-18 to 2019-20, with

² Australian Energy Market Commission 2018, *Residential electricity price trends 2018*, < <https://www.aemc.gov.au/market-reviews-advice/residential-electricity-price-trends-2018> >.

prices then remaining largely flat in 2020-21.³ The forecast fall in prices reflected flat demand over the forecast period combined with new renewable generation capacity entering the market, including Queensland Solar 150.

From the current year (2018-19), the EY modelling forecasts wholesale costs will fall from 8.88c/kWh to 6.56c/kWh in 2020-21, a fall of 26%. The vast majority of this reduction is forecast to occur in 2019-20 with minimal change in 2020-21.

Alternative modelling undertaken by Acil Allen for the QCA⁴ also suggests that the reductions in wholesale prices will occur in the short term. Although the Acil Allen reports on price changes to 2019-20 (and not 2020-21 like EY) the Acil Allen wholesale price reductions are generally less than the EY/AEMC predictions. Acil Allen forecasts a reduction in wholesale base prices of 8%.

Beyond 2020-21, Deloitte Access Economics has assumed that wholesale electricity costs are constant in real terms.

Network costs

Network distribution and transmission costs are determined by the AER. Distribution costs form a larger proportion of network costs than transmission costs.

Distribution network prices are currently set to July 2020. On 31st January 2019, Ergon Energy submitted its regulatory proposal to the AER for the period 1 July 2020 to 30 June 2025.⁵ Ergon Energy has proposed significant reductions in distribution prices in this submission to the AER. Network charges are forecast to fall 4.5% in real terms from 2019-20 to 2020-21.⁶ Deloitte Access Economics has incorporated the information specific to Ergon Energy to adjust the broader distribution cost forecast provided by the AEMC in 2020-21. Reflecting easing cost pressure, Deloitte Access Economics has forecast that network distribution costs remain constant in nominal terms in 2021-22, before increasing in line with CPI from 2022-23.

Powerlink is the relevant provider of network transmission services in Queensland. Transmission prices are set by the AER for Powerlink until 30 June 2022.⁷ Allowable revenues were to change by CPI – 0.15% on each of 1 July 2018, 2019, 2020 and 2021. However, as the cost of debt has fallen since the time of the AER's decision, the actual change on 1 July 2018 was CPI – 0.47% and will be CPI – 0.36% on 1 July 2019.⁸ A reasonable forecast is that maximum allowed revenue changes will be in the range of CPI – 0.50% in 2020 and 2021. The allowable change in revenue is broader than the change in prices, with demand being the key variable. Deloitte Access Economics considers it reasonable that transmission prices will not move at all in nominal terms until 1 July 2022.

Using a combination of information from AEMC and Ergon Energy and the AER, it is reasonable to assume distribution costs relevant to GAWB will ease from 9.79c/kWh in 2018-19 to 9.31c/kWh in 2021-22, a decline of 4.9%. Transmission costs are forecast to be constant over this period at 1.76c/kWh, a 0% nominal change. Beyond this period, distribution and transmission costs are held constant in real terms for the remainder of the forecast period.

³ Australian Energy Market Commission 2018, *2018 Residential Electricity Price Trends – Wholesale Market Costs Modelling* (prepared by Ernst & Young), p.65.

⁴ Acil Allen Consulting, *Estimated Energy Costs, Report to the Queensland Competition Authority*, 19 February 2019

⁵ AER 2019, *Ergon Energy – Determination 2020-25*, < <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/ergon-energy-determination-2020-25/proposal> >.

⁶ Ergon Energy 2019, *Ergon Energy Regulatory Proposal 2020-25*, p.117 < https://www.aer.gov.au/system/files/Ergon%20Energy%20-%201.004%20-%20Regulatory%20Proposal%202020-25%20-%20January%202019_1.pdf >.

⁷ AER 2017, *Powerlink – Determination 2017-22*, < <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/powerlink-determination-2017-2022/final-decision> >.

⁸ AER 2019, *Powerlink – Determination 2017-22, Updates* < <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/powerlink-determination-2017-2022/updates> >.

Retail costs

Retail costs reflect the retail margin on top of the other costs of electricity (network, wholesale, green schemes and metering). The retail component of electricity costs include those costs related to electricity retailer’s billing, advertising, call centres as well as a profit margin. According to the AEMC, retail costs are forecast to increase from 6.79c/kWh in 2018-19 to 7.14c/kWh in 2020-21, an increase of 5.2%. Beyond 2020-21, Deloitte Access Economics has assumed that retail costs remain constant in real terms.

Green schemes

From a policy perspective, Queensland’s 50% renewable energy target by 2030 is relevant to the price outlook. According to the AEMC, green scheme costs are forecast to ease from 1.62c/kWh in 2018-19 to 1.48/kWh in 2020-21, a decline of 8.6%. Beyond 2020-21, Deloitte Access Economics has assumed that green scheme costs remain constant in real terms.

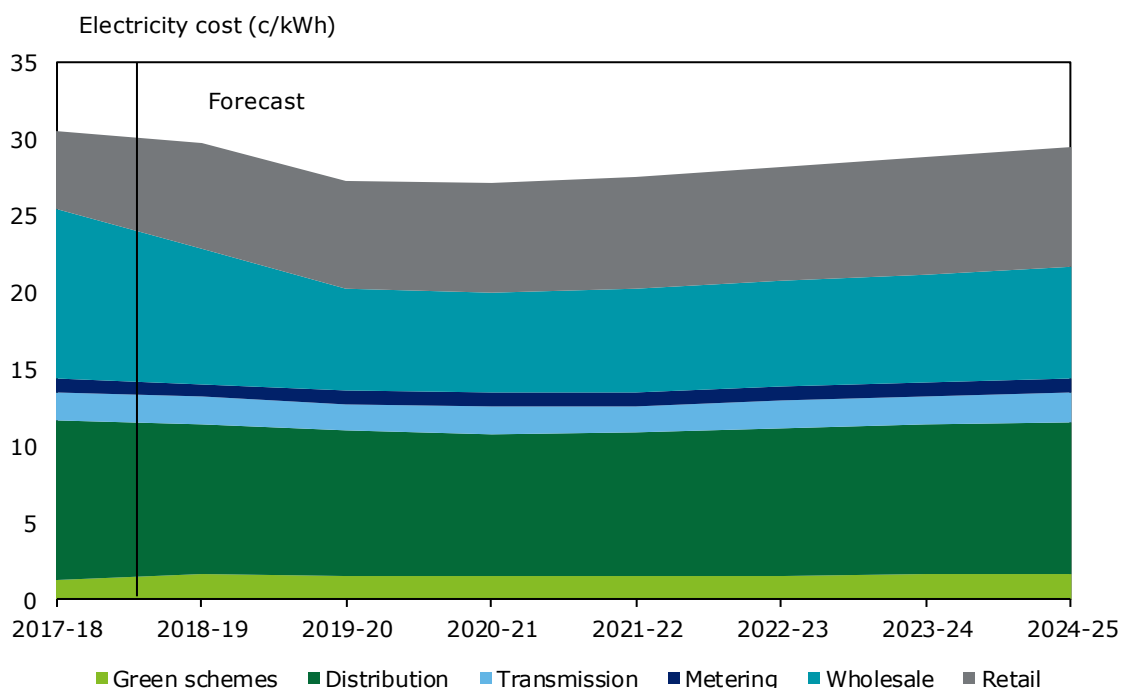
Metering

Metering costs are a relatively small component of electricity costs. According to the AEMC, metering costs are forecast to increase from 0.86c/kWh in 2018-19 to 0.89c/kWh in 2020-21, an increase of 3.5% over the two years or broadly similar to forecast CPI growth over these two years. Beyond 2020-21, Deloitte Access Economics considers it is reasonable to assume that metering costs are constant in real terms.

Summary

The resulting forecast for electricity prices relevant to GAWB is shown in Chart 2.8. Electricity prices are forecast to moderate in coming years, largely led by a fall in wholesale prices. Beyond the short-term, electricity prices are forecast to rise in line with inflation.

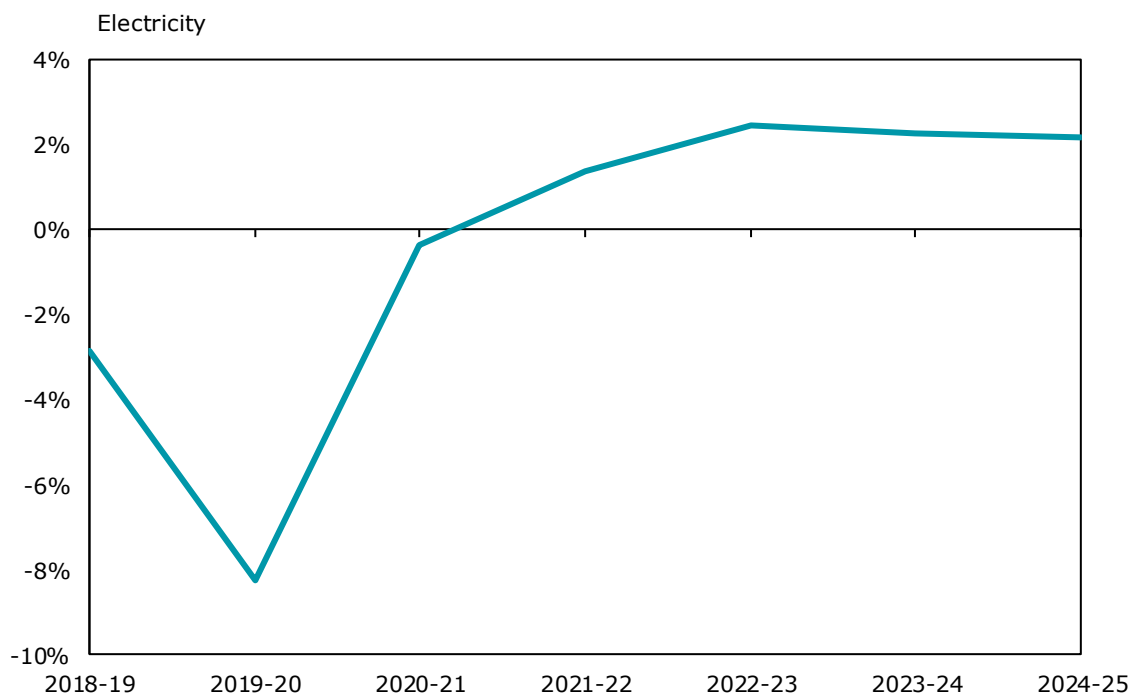
Chart 2.8: Forecast electricity costs in Queensland (by component)



Source: Deloitte Access Economics, AEMC

This forecast gives rise to the cost escalation factors for electricity shown in Chart 2.9. Electricity prices are expected to fall in coming years before starting to increase again with broader CPI.

Chart 2.9: Cost escalation factors: electricity



Source: Deloitte Access Economics, AEMC

2.7 Chemicals

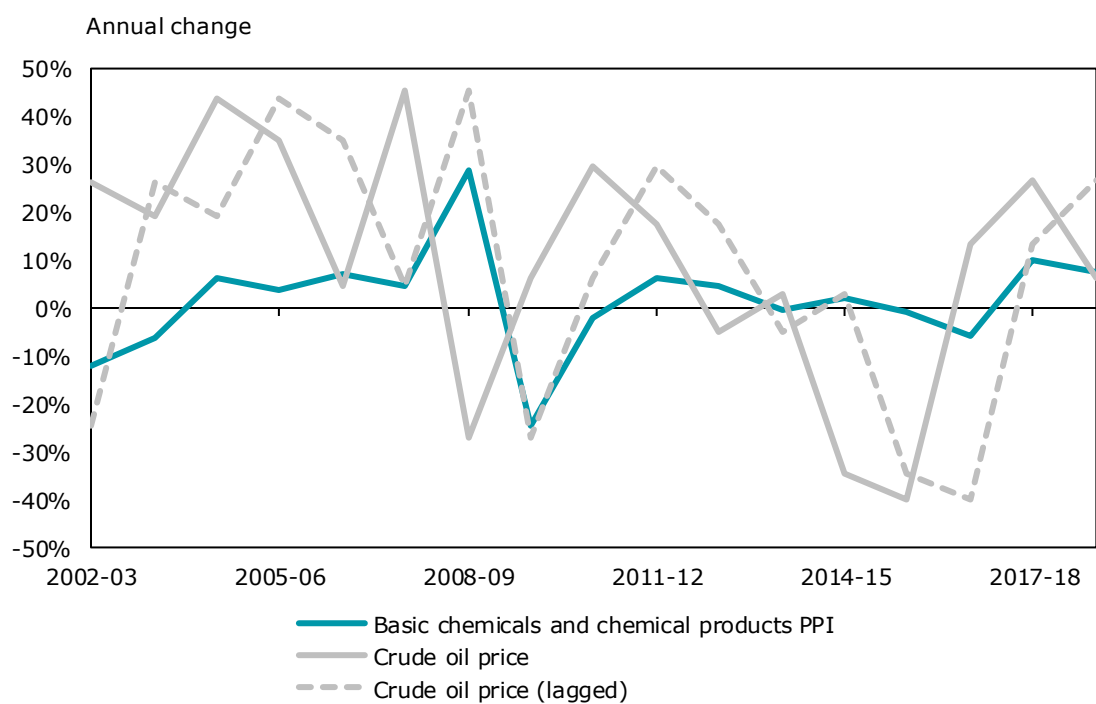
GAWB’s expenditure on chemicals has been relatively stable in recent financial years. GAWB consumes chemicals such as:

- Magnafloc LT
- Dense Soda Ash
- Liquid Alum TIF
- Sodium Hypochlorite 13%.

Based on an analysis of pricing data between 2016 and 2019, recent price increases for these chemicals has been modest and typically below the rate of inflation.

Deloitte Access Economics has considered the producer price index (PPI) for basic chemicals and chemicals products. Chart 2.10 shows historical movements in the basic chemicals and chemicals products PPI have been positively correlated with movements in crude oil prices, with crude oil prices tending to lead movements in the PPI by one year (correlation coefficient: 0.69). Chart 2.11 also shows that the price of base chemicals and chemical products has been volatile; consistent with broader commodity prices. The price of chemicals rose quickly leading into the 2008 Financial Crisis before falling sharply as world demand fell in response to the adverse economic shock. Prices came under renewed pressure in 2015-16 and 2016-17, before increasing again as commodity prices rose, aided by renewed stimulus in China.

Chart 2.10: Chemicals PPI; comparison to crude oil prices

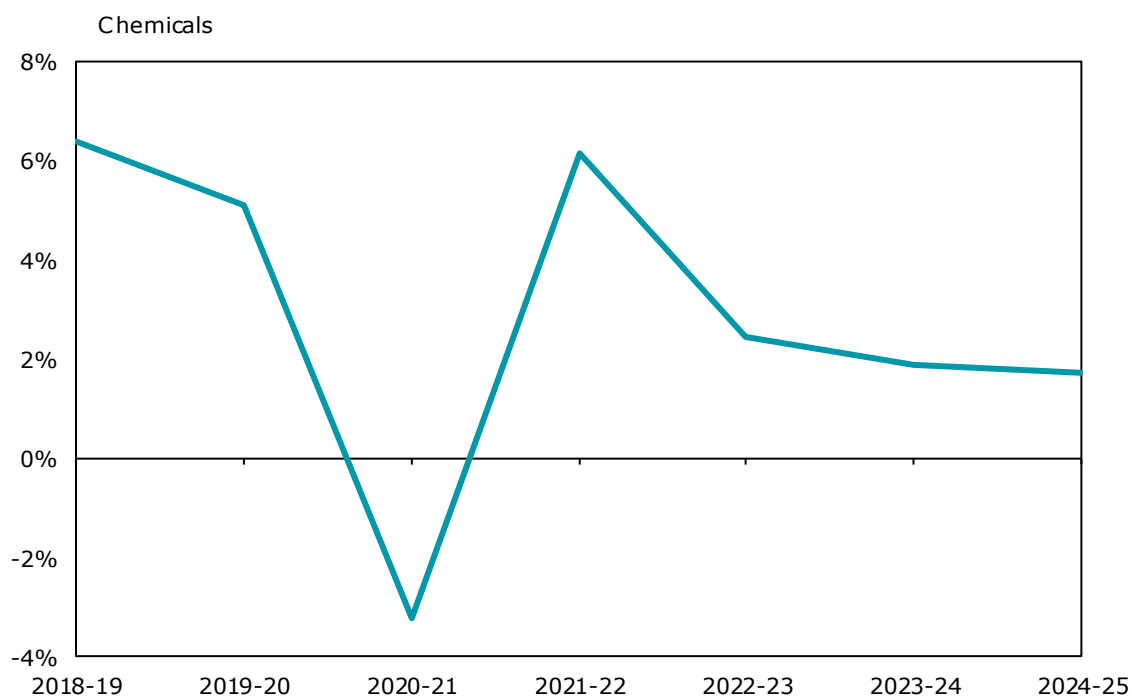


Source: Deloitte Access Economics

Note: 2018-19 index value for the PPI is assumed to be the average of the first three quarters of the financial year.

Deloitte Access Economics forecasts crude oil prices as a part of its regular modelling processes, and therefore changes in crude oil prices (lagged by one year) are forecast to drive cost escalation factors for chemicals from 2019-20 onwards. The resulting forecast is shown in Chart 2.11, which shows some short-term volatility reflecting forecast movements in the crude oil price.

Chart 2.11: Cost escalation factors: chemicals



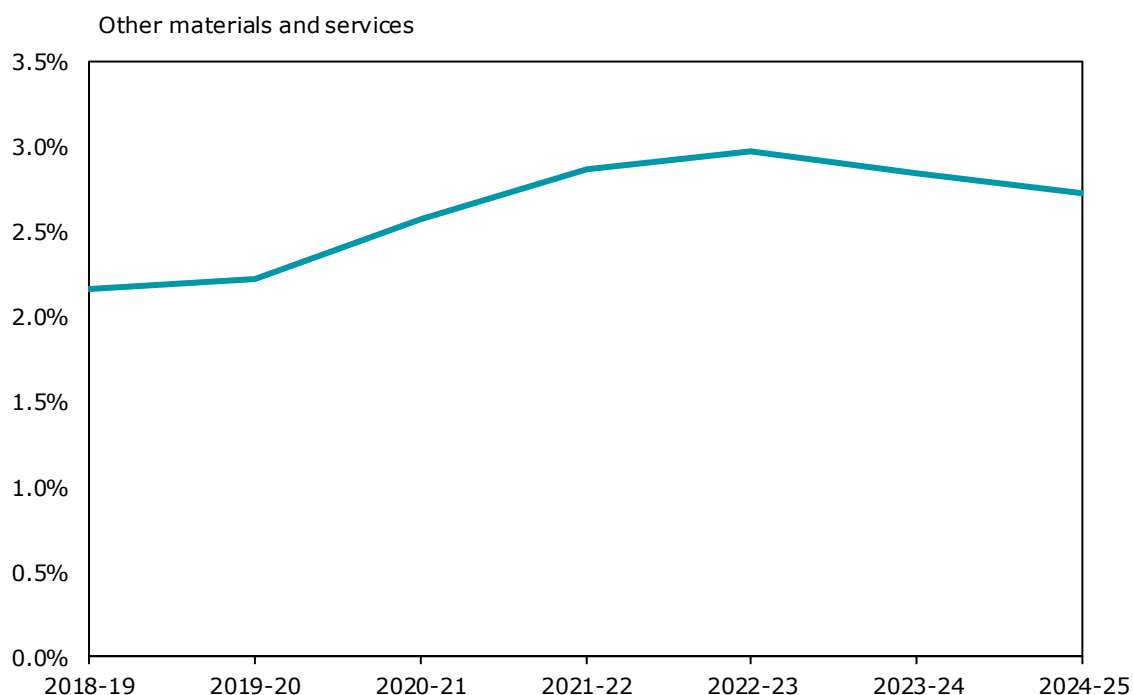
Source: Deloitte Access Economics

2.8 Other materials and services

Based on correspondence with GAWB, Deloitte Access Economics understands that materials and services mainly relates to maintenance activities. According to the maintenance department at GAWB, service/labour costs make up around 70-80% of maintenance costs, with materials between 20-30%. Given this, Deloitte Access Economics has taken the mid-point of these bands, implying 75% of maintenance costs relate to labour and 25% to materials.

In forecasting cost escalation factors, Deloitte Access Economics has forecast that service costs increase with Queensland WPI and material costs increase with Brisbane CPI. The above weights are used to give rise to the resulting cost escalation factors shown in Chart 2.12.

Chart 2.12: Cost escalation factors: other materials and services



Source: Deloitte Access Economics

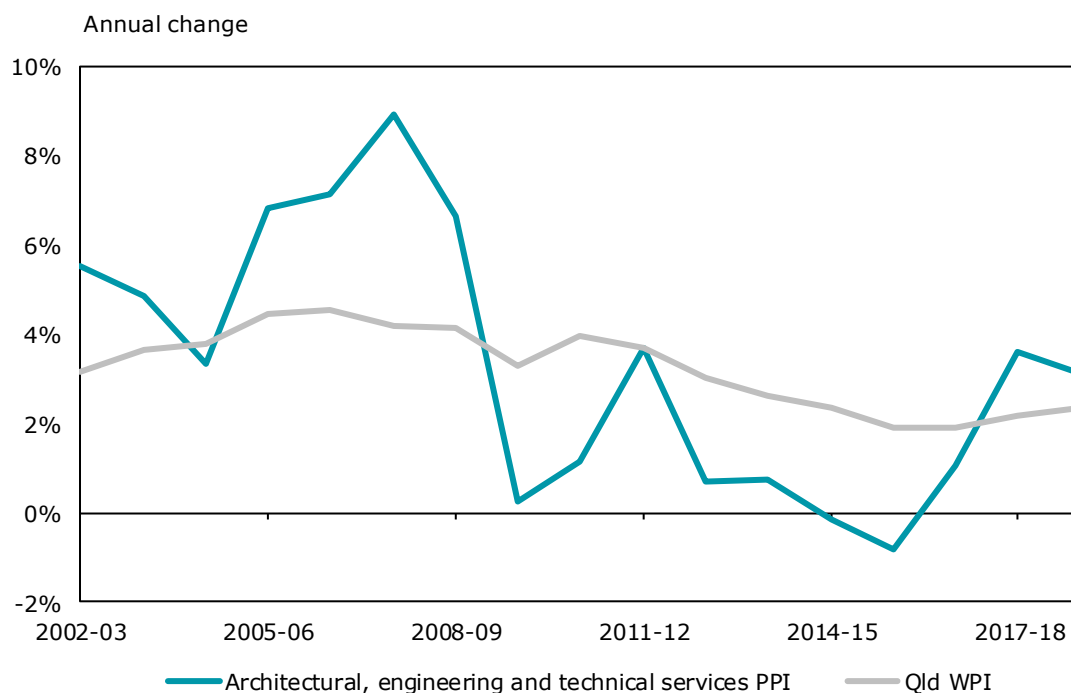
2.9 Professional services (engineering)

GAWB engages labour based engineering services on an ongoing basis. Deloitte Access Economics has utilised the PPI for architectural, engineering and technical services as proxy for cost escalation factors for professional services (engineering).

Chart 2.13 shows how the PPI has changed relative to WPI growth. The weak increases in the PPI post the 2008 Financial Crisis likely reflected challenging conditions for engineering services in Queensland (and Australia more broadly) amid the winding down of mining investment and a normalisation of commodity prices. However, after contracting in 2014-15 and 2015-16, a bottoming out in mining investment activity in the Australian economy and a return to healthier commodity prices have seen the PPI return to positive growth.

This chart also shows that growth in wages has been a reasonable longer-term proxy for increases in the PPI. From 2001-02 to 2018-19, the PPI for architectural, engineering and technical services increased by a CAGR of 3.3%, compared to 3.2% for Queensland WPI.

Chart 2.13: Architectural, engineering and technical services PPI and Queensland WPI growth



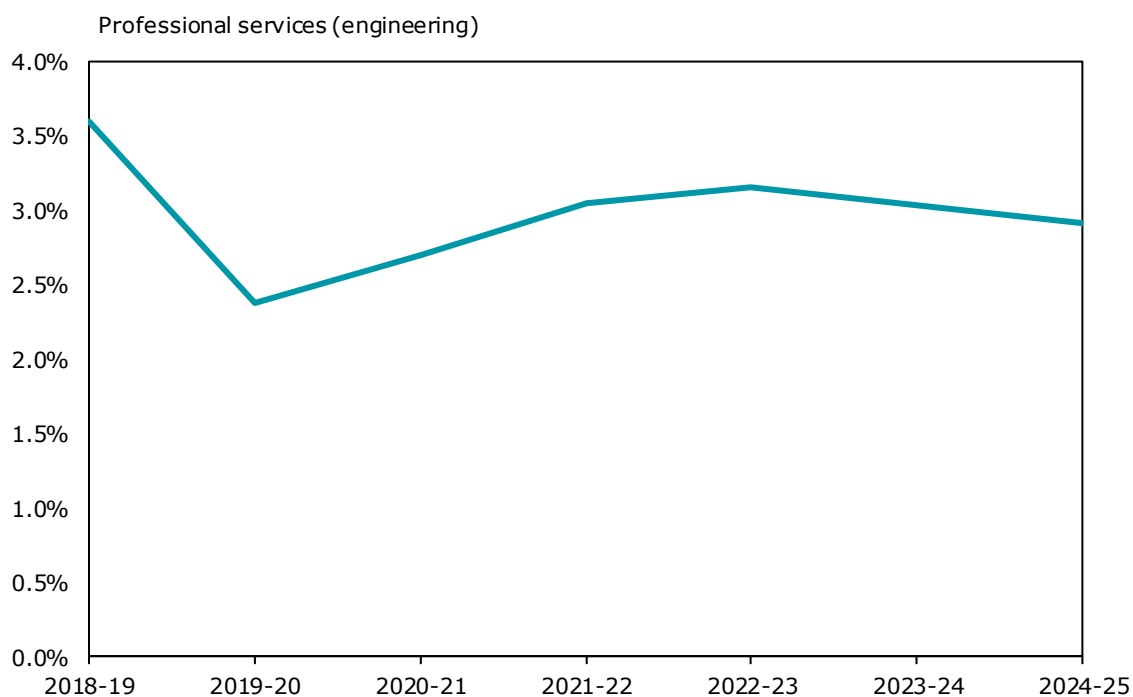
Source: Deloitte Access Economics

Note: 2018-19 index value for the PPI is assumed to be the average of the first three quarters of the financial year.

As a result, in forecasting future cost escalation factors, Deloitte Access Economics has forecast that the price of professional services will increase with Queensland WPI growth, with the resulting forecast shown in Chart 2.14.

This forecast can be taken as a baseline forecast for cost escalation factors, and there may be unforeseen cyclicality due to unexpected movements in commodity prices, and therefore mining investment activity in Australia more broadly. In periods of higher investment activity, there will be upward pressure on the prices of engineering services and vice versa in weaker periods for mining investment activity.

Chart 2.14: Cost escalation factors: professional services (engineering)



Source: Deloitte Access Economics, GAWB

2.10 Capex

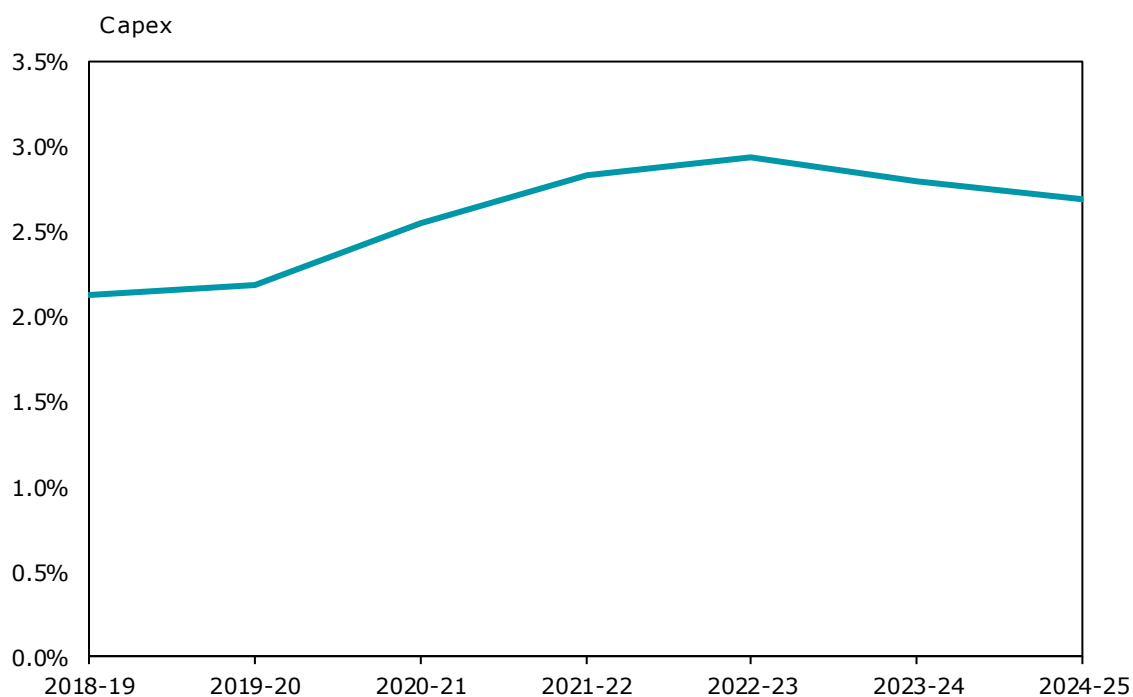
GAWB provided forecast capex spend for the period from 2020-21 to 2024-25, which showed a variable profile, reflecting the 'lumpy' nature of capital expenditure as opposed to operating expenditure.

Given the data challenges in relation to isolating changes in the price of capital expenditure, Deloitte Access Economics has utilised other data sources. The labour income share for the construction industry was 70% in 2017-18, with the capital income share 30%.⁹

In forecasting cost escalation factors, Deloitte Access Economics has forecast that labour costs increase with Queensland WPI and capital costs increase with Brisbane CPI. The above weights are used to give rise to the resulting cost escalation factors shown in Chart 2.15.

⁹ Australian Bureau of Statistics, *Estimates of Industry Multifactor Productivity 2017-18*, Cat No 5260.0.55.002 (28 May 2019).

Chart 2.15: Cost escalation factors: capex



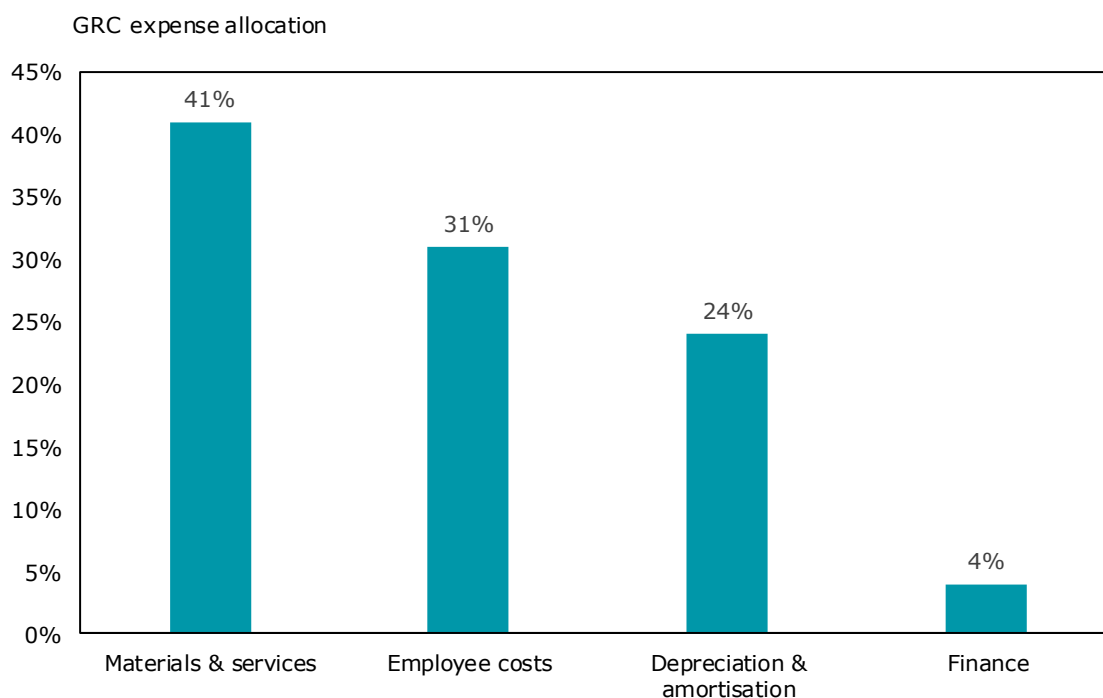
Source: Deloitte Access Economics

2.11 Rates (Gladstone Regional Council)

GAWB pays rates to the Gladstone Regional Council (GRC). Rates are used to help the Council meet the needs of the community. GRC’s revenue is largely funded by general rates and service charges (2017-18: 72% of revenue), with fees and charges, other recurrent revenue, operating grants and contributions also contributors.¹⁰ Chart 2.16 shows GRC’s expense allocation across different expenditure categories in 2017-18.

¹⁰ *ibid*, p.20.

Chart 2.16: Gladstone Regional Council, expense allocation (2017-18)



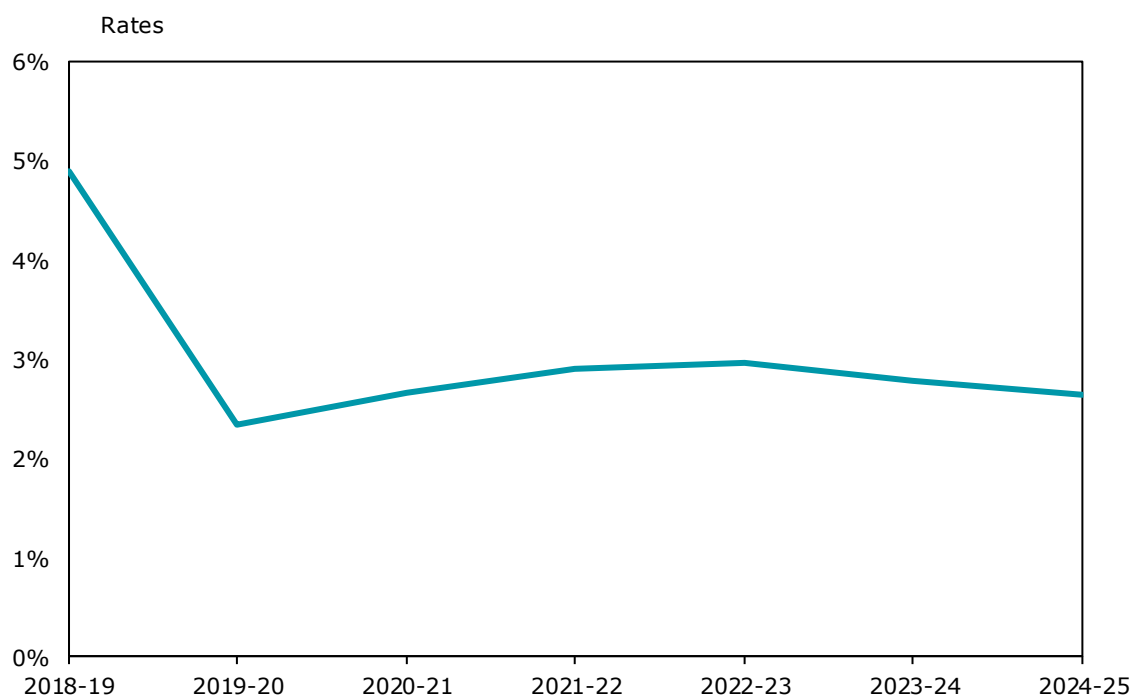
Source: Gladstone Regional Council, Deloitte Access Economics

In forecasting cost escalation factors for council rates, Deloitte Access Economics has taken into account the four cost categories of GRC and the weights from the 2017-18 GRC Annual Report:

- **Materials and services:** as in GAWB’s case, materials and services comprises both the use of labour and material inputs. Deloitte Access Economics has assumed that the 75% weight for labour and 25% for materials is similarly appropriate for the GRC, with Queensland WPI and CPI relevant to future cost increases respectively.
- **Employee costs:** Deloitte Access Economics has assumed future cost escalation factors for GAWB are reasonable in forecasting future changes in GRC’s employee costs. That implies wage increases exceed Queensland WPI in the short-term, before converging in the mid-2020s.
- **Depreciation & amortisation:** depreciation and amortisation costs reflect the value of the asset and its useful life. The nominal value of assets will increase over time with broader inflation. Deloitte Access Economics has therefore forecast changes in this component increase with Queensland CPI.
- **Finance:** finance costs are forecast to increase over time, with more debt taken on with rising prices over time necessitating larger nominal loans. Finance costs are forecast to increase over time with Queensland CPI.

The resulting cost escalation factors for GRC rates are shown in Chart 2.17.

Chart 2.17: Cost escalation factors: Gladstone Regional Council rates



Source: Deloitte Access Economics, GAWB

2.12 Insurance

Deloitte Access Economics received insurance expenditure data from GAWB as well as annual reports from a relevant insurance broker. The insurance taken out by GAWB covers a range of areas such as:

- ISR (Industrial Special Risks Insurance)
- Motor vehicles
- Corporate travel
- Group personal accident
- Marine inland
- Marine hull
- Crime
- Directors & Officers Liability
- Statutory Liability & Inquiry Costs
- Employment practices liability
- Combined liability.

Chart 2.18 shows the shares of GAWB insurance spend in 2018-19 accruing to the different categories, with a range of smaller categories included in 'Other'. Expenditure on ISR insurance comprised the largest component of expenditure, followed by combined liability and director and officers' liability.

ISR insurance is a wide coverage business insurance policy that provides cover for a range of loss scenarios or damage done to high value physical assets including property, buildings, materials and machinery. The increasing nominal value of assets over time can be expected to continue to lead to an increase in the cost of this form of insurance as the replacement cost of assets rises. The risk of more frequent extreme weather events may also increase the cost of ISR insurance over time.

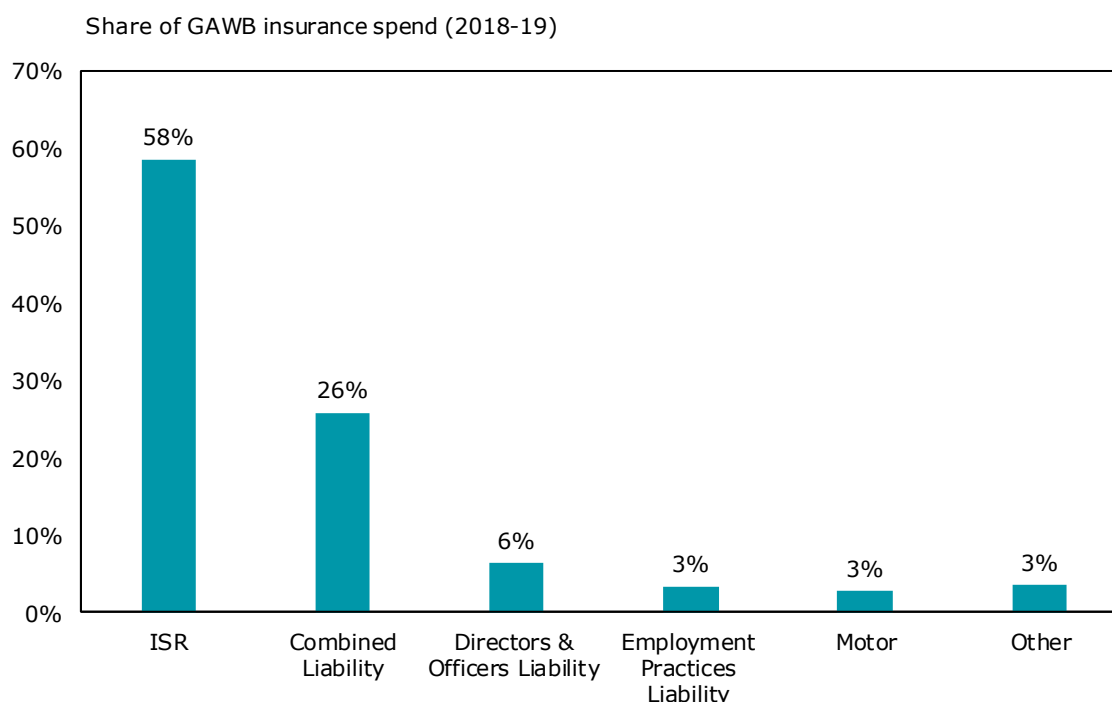
Combined liability insurance is also known as public and products liability insurance and covers:

- Personal injury to third parties arising from business activities or goods sold

- Damage to third party property arising from business activities or goods sold
- Personal injury to third parties arising from advertising liability.

Costs for this form of insurance can be expected to rise over time with nominal economic costs from breaches increasing over time with broader inflation.

Chart 2.18: Share of GAWB insurance spend (2018-19)



Source: Deloitte Access Economics, GAWB

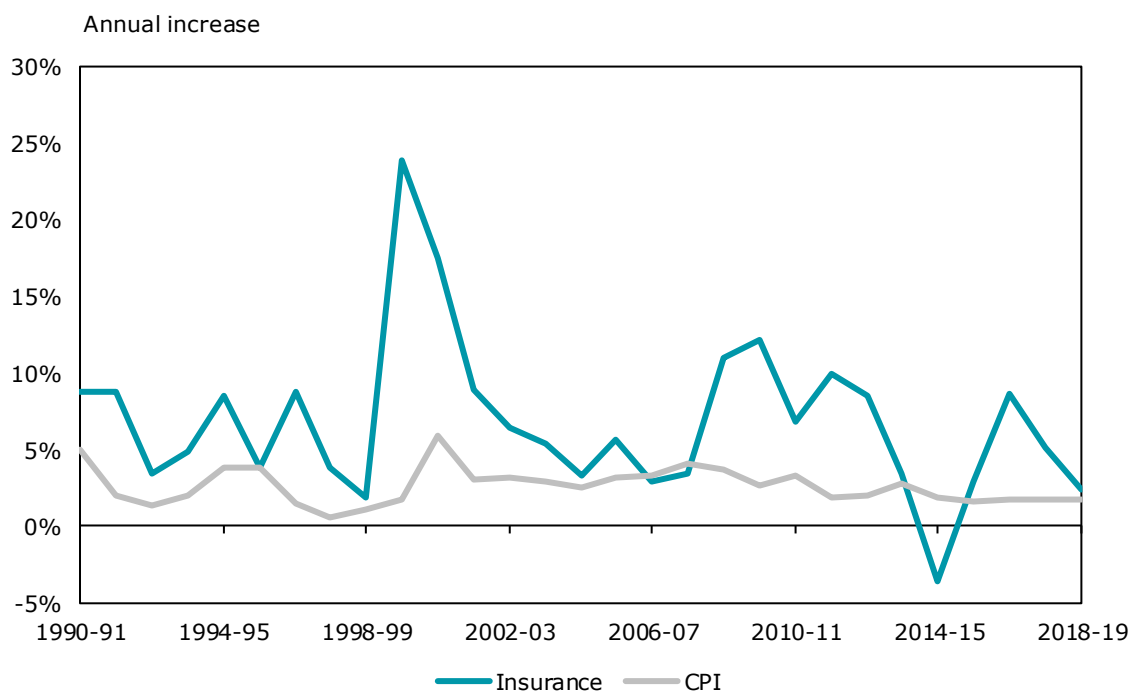
In analysing the insurance data provided, Deloitte Access Economics found it very difficult to accurately track changes in the 'price' of insurance. This reflects a range of factors, such as different categories of insurance taken out, changing asset values and scope of insurance within those categories and the changing of insurance providers. This made it impractical to derive a historical underlying 'price' series for the different types of insurance. Nonetheless, historic price rises appear to have exceeded broader CPI growth.

This is consistent with trends in the insurance price series contained in the ABS' detailed CPI data. Over the sample period, price increases in insurance have significantly exceed changes in broader Brisbane CPI. From 2008-09 to 2018-19,¹¹ the price of insurance has increased by a CAGR of 5.5%, 3.4% higher than the annual increase in broader inflation.

Deloitte Access Economics appreciates the basket of insurance policies taken out by GAWB may not align perfectly with those insurance products underlying the CPI expenditure category. Nonetheless, broad drivers of prices in the insurance market, such as legal and regulatory changes and changes in operating costs (wages, commercial rents, compliance costs and so on) for providers are broadly similar across different insurance markets.

¹¹ Note, June-2019 observation for insurance prices is outstanding and the 2018-19 index value is assumed to be the average of the first three quarters of the year. This will not materially affect the calculation of average growth over the past ten years.

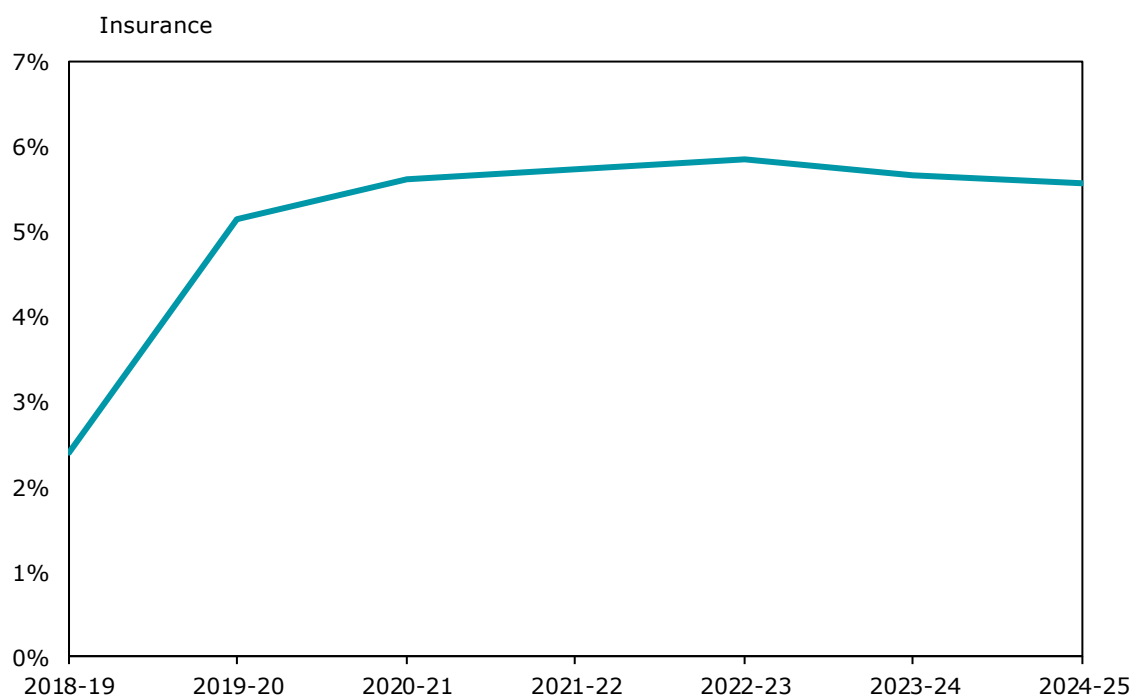
Chart 2.19: Annual change in Brisbane insurance prices and CPI



Source: Deloitte Access Economics, ABS

Deloitte Access Economics considers it likely that future insurance price increases will continue to exceed broader CPI growth. Climate-related risks are anticipated to be significant over the forecast period, thereby increasing the cost of insurance on top of broader CPI. Climate-related risks affect the safety of GAWB’s assets, which will be reflected in the large ISR insurance category. Subsequently, cost escalation factors for insurance are forecast to increase from their estimated 2.4% increase in 2018-19 to CPI growth plus the observed 3.4% historical premium in the forecast period thereafter as shown in Chart 2.20.

Chart 2.20: Cost escalation factors: insurance



Source: Deloitte Access Economics

It is worth stressing that this forecast is subject to the same assumptions noted in the 'indicative' insurance cost data provided to Deloitte Access Economics:

- No changes in the number of assets insured (i.e. this is a price, not quantity, forecast).
- No claims
- No increase in reinsurance costs.

And that actual pricing may vary dependent on a range of other factors including, but not limited to:

- The insured's financial position and performance and claims experience,
- Changes to the board and management
- External factors such as availability of insurers, insurance market influences, changes to insurer's underwriting guidelines, industry/sector claims experience, legislation, compliance and regulatory environment.

2.13 Real cost escalation factors

Real cost escalation factors have been calculated by deflating nominal cost escalation factors by annual growth in Brisbane CPI.

$$Real\ cost\ escalation\ factor_t = \frac{(1 + Nominal\ cost\ escalation\ factor_t)}{(1 + Brisbane\ CPI_t)} - 1$$

As a result, the real cost escalation factor for CPI is zero while real cost escalation factors for other cost categories are above zero if their nominal cost escalation factor in a given year exceeds CPI and vice versa. Table 2.3 shows the CAGR for real cost escalation factors over the forecast period.

Table 2.3: Real cost escalation factors

Cost category	CAGR (2020-21 to 2024-25)
CPI	0.00%
Employee costs	0.89%
Contract labour costs	0.72%
Contractors (service delivery)	0.72%
Electricity	-0.23%
Chemicals	0.71%
Other materials and services	0.54%
Professional services (engineering)	0.72%
Capex	0.50%
Rates (Gladstone Regional Council)	0.50%
Insurance	3.33%

Source: Deloitte Access Economics

Limitation of our work

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